

Kathleen Fuller

Access DB# 160084

# SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Laura Ullmer Examiner #: 71724 Date: 7/18/05  
Art Unit: \_\_\_\_\_ Phone Number 301-212-9411 Serial Number: 10/048,054  
Mail Box and Bldg/Room Location: 6083 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: See Front Page  
Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_ ILL

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

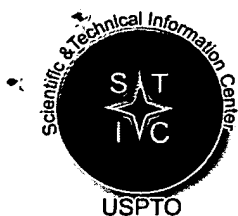
I would you search for a cell comprising <sup>an electrolyte comprising</sup> a phosphate derivative of Formula (2) wherein each R<sup>4</sup> is either monovalent substituent or a halogen element where at least one of R<sup>4</sup> is a halogen element  $3 \leq n \leq 15$ .  
See p26 (attached to define R<sup>4</sup>).

If can find above please then search for when cell comprising an electrolyte comprising phosphate derivative of formula (1).

Thanks,  
Laura

\*\*\*\*\*  
STAFF USE ONLY

	Type of Search	Vendors and cost where applicable
Searcher: <u>X. Fuller</u>	NA Sequence (#) _____	STN <u>✓</u>
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: _____	Structure (#) <u>1</u>	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic _____	Dr. Link _____
Date Completed: <u>8/10/05</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>30</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>26</u>	Other _____	Other (specify) _____



# **STIC Search Report**

**EIC 1700**

**STIC Database Tracking Number: 160084**

**TO: Laura Weiner**

**Location: 6C83**

**Art Unit : 1745**

**August 10, 2005**

**Case Serial Number: 10048054**

**From: Kathleen Fuller**

**Location: EIC 1700**

**REMSEN 4B28**

**Phone: 571/272-2505**

**Kathleen.Fuller@uspto.gov**

## **Search Notes**

I searched the formula 1 first; there are some good answers. Then I realized you wanted formula 2 . There were 187 structures but none with utility. I printed out 2 answers where there were 3-15 phosphorus per the claims-none on utility.



# STIC Search Results Feedback Form

**EIC17000**

Questions about the scope or the results of the search? Contact *the EIC searcher* or contact:

Kathleen Fuller, EIC 1700 Team Leader  
571/272-2505 REMSEN 4B28

## Voluntary Results Feedback Form

- I am an examiner in Workgroup:  Example: 1713
- Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature  
(journal articles, conference proceedings, new product announcements etc.)

- Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

10/048054

WEINER ~~10/936148~~ 08/10/2005 RPage 1

=> file reg

FILE 'REGISTRY' ENTERED AT 11:19:04 ON 10 AUG 2005  
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STRUCTURE FILE UPDATES: 9 AUG 2005 HIGHEST RN 859282-03-4  
DICTIONARY FILE UPDATES: 9 AUG 2005 HIGHEST RN 859282-03-4

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TSCA INFORMATION NOW CURRENT THROUGH JANUARY 18, 2005

Please note that search-term pricing does apply when  
conducting SmartSELECT searches.

\*\*\*\*\*  
\*  
\* The CA roles and document type information have been removed from \*  
\* the IDE default display format and the ED field has been added, \*  
\* effective March 20, 2005. A new display format, IDERL, is now \*  
\* available and contains the CA role and document type information. \*  
\*  
\*\*\*\*\*

Structure search iteration limits have been increased. See HELP SLIMITS  
for details.

Experimental and calculated property data are now available. For more  
information enter HELP PROP at an arrow prompt in the file or refer  
to the file summary sheet on the web at:  
<http://www.cas.org/ONLINE/DBSS/registryss.html>

=> file hcaplus

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FILE COVERS 1907 - 10 Aug 2005 VOL 143 ISS 7  
FILE LAST UPDATED: 9 Aug 2005 (20050809/ED)

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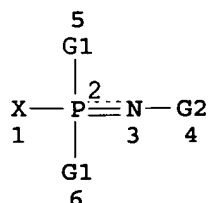
This file contains CAS Registry Numbers for easy and accurate  
substance identification.

KATHLEEN FULLER EIC1700 REMSEN 4B28 571/272-2505

=&gt; d que

L3

STR



*1,582 structures from this query  
formula I*

VAR G1=A/X

VAR G2=C/SI/GE/SN/N/P/AS/SB/BI/O/S/SE/TE/PO

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 6

STEREO ATTRIBUTES: NONE

L5 1582 SEA FILE=REGISTRY SSS FUL L3

L6 1038 SEA FILE=HCAPLUS ABB=ON L5

L7 17 SEA FILE=HCAPLUS ABB=ON L6 (L) ELECTROLYT?

L8 13 SEA FILE=HCAPLUS ABB=ON L7 AND ELECTROCHEM?/SC,SX,AB,BI

L9 12 SEA FILE=HCAPLUS ABB=ON L6 AND BATTER?

L10 14 SEA FILE=HCAPLUS ABB=ON L8 OR L9

=&gt; d l10 bib abs ind hitstr 1-14

*14 CA references with utility*

L10 ANSWER 1 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2005:368511 HCAPLUS

DN 142:433056

TI Secondary nonaqueous electrolyte **battery**

IN Koto, Tomoko

PA Japan Storage Battery Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2005116306	A2	20050428	JP 2003-348133	20031007
PRAI	JP 2003-348133		20031007		

AB The **battery** has a cathode, containing a Li-Ni-Mn composite oxide :

Lix NiyMn2-yO4-δ (0&lt; x&lt; 1.1; 0.45&lt; yr&lt; 0.55; and 0≤ δ&lt;

0.4) as a cathode active mass, an anode, and a nonaq. electrolyte solution;

where the electrolyte solution contains 0.1-20 mass% phosphazene derivative

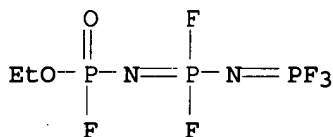
IC ICM H01M010-40

ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium **battery** cathode lithium manganese nickeloxide; **battery** electrolyte phosphazene derivIT **Battery** cathodes**Battery** electrolytes

- (cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium **batteries**)
- IT Polyphosphazenes  
RL: MOA (Modifier or additive use); USES (Uses)  
(cyclic; cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium **batteries**)
- IT Secondary **batteries**  
(lithium; cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium **batteries**)
- IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 7782-42-5, Graphite, uses 12031-75-3, Lithium manganese nickel oxide (LiMn<sub>1.5</sub>Ni<sub>0.5</sub>O<sub>4</sub>) 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); USES (Uses)  
(cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium **batteries**)
- IT 850650-07-6  
RL: MOA (Modifier or additive use); USES (Uses)  
(cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium **batteries**)
- IT 850650-07-6  
RL: MOA (Modifier or additive use); USES (Uses)  
(cathodes containing lithium manganese nickel oxides and electrolytes containing phosphazene derivs. for secondary lithium **batteries**)
- RN 850650-07-6 HCAPLUS  
CN Phosphoramidofluoridic acid, [difluoro[(trifluorophosphoranylidene)amino]p hosphoranylidene]-, ethyl ester (9CI) (CA INDEX NAME)



L10 ANSWER 2 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:589783 HCAPLUS

DN 141:126373

TI Separator for nonaqueous electrolyte **battery**

IN Kanno, Hiroshi; Otsuki, Masashi; Eguchi, Shinichi

PA Bridgestone Corporation, Japan

SO PCT Int. Appl., 32 pp.

CODEN: PIXXD2

DT Patent

LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004062002	A1	20040722	WO 2003-JP16360	20031219
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO,				

NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ,  
 TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW  
 RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ,  
 BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
 ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK,  
 TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRAI JP 2002-380683 A 20021227

AB The separator, which is incombustible even when the inside of a  
**battery** has a high temperature and useful for a primary or secondary Li  
**battery**, comprises a micro-porous film formed by adding a  
 phosphazene derivative and/or an isomer of a phosphazene derivative to a polymer.

IC ICM H01M002-16

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte **battery** incombustible separator phosphazene  
 deriv added polymer

IT Primary **battery** separators

Secondary **battery** separators

(separators containing phosphazene derivative added polymers for primary and  
 secondary lithium **batteries**)

IT 7439-93-2, Lithium, uses

RL: DEV (Device component use); USES (Uses)

(anode; separators containing phosphazene derivative added polymers for primary  
 and secondary lithium **batteries**)

IT 1313-13-9, Manganese dioxide, uses 12190-79-3, Cobalt lithium oxide  
 (CoLiO<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)

(cathode; separators containing phosphazene derivative added polymers for  
 primary and secondary lithium **batteries**)

IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8,

Diethyl carbonate 957-13-1 1184-10-7 2397-48-0 9002-88-4,

Polyethylene 14283-07-9, Lithium tetrafluoroborate 33027-68-8

722454-84-4 722454-86-6 724792-59-0

RL: DEV (Device component use); USES (Uses)

(separators containing phosphazene derivative added polymers for primary and  
 secondary lithium **batteries**)

IT 724792-60-3

RL: DEV (Device component use); USES (Uses)

(separators containing phosphazene derivative added polymers for primary and  
 secondary nonaq. electrolyte **batteries**)

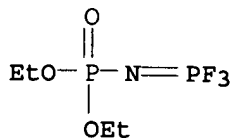
IT 722454-84-4 722454-86-6

RL: DEV (Device component use); USES (Uses)

(separators containing phosphazene derivative added polymers for primary and  
 secondary lithium **batteries**)

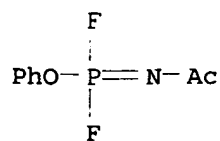
RN 722454-84-4 HCAPLUS

CN Phosphoramidic acid, (trifluorophosphoranylidene)-, diethyl ester (9CI)  
 (CA INDEX NAME)



RN 722454-86-6 HCAPLUS

CN Phosphorodifluoridimidic acid, acetyl-, phenyl ester (9CI) (CA INDEX  
 NAME)



L10 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:570217 HCAPLUS

DN 141:126304

TI Additive for secondary **battery** nonaqueous electrolyte solution and the **battery**

IN Otsuki, Masashi; Horikawa, Yasuro

PA Bridgestone Corporation, Japan

SO PCT Int. Appl., 33 pp.

CODEN: PIXXD2

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004059782	A1	20040715	WO 2003-JP16592	20031224
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
PRAI	JP 2002-377142	A	20021226		

AB The additive comprises a phosphazene derivative represented by R13P = N-X (R1 = halo or monovalent substituent; and X = C, Si, N, P, O and/or S containing organic group). The **battery** has a nonaq. electrolyte solution comprising the above additive, a cathode, and an anode.

IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium **battery** nonaq electrolyte additive phosphazene derivIT **Battery** electrolytes(additives containing phosphazene derivs. for secondary **battery** electrolytes)IT Secondary **batteries**(lithium; additives containing phosphazene derivs. for secondary **battery** electrolytes)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 12190-79-3, Cobalt lithium oxide (CoLiO2) 21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(additives containing phosphazene derivs. for secondary **battery** electrolytes)

IT 2397-48-0 722454-84-4 722454-85-5 722454-86-6

RL: MOA (Modifier or additive use); USES (Uses)

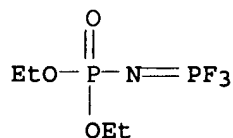
(additives containing phosphazene derivs. for secondary **battery** electrolytes)

IT 722454-84-4 722454-86-6



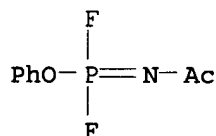
RL: MOA (Modifier or additive use); USES (Uses)  
(additives containing phosphazene derivs. for secondary battery electrolytes)

RN 722454-84-4 HCAPLUS

CN Phosphoramidic acid, (trifluorophosphoranylidene)-, diethyl ester (9CI)  
(CA INDEX NAME)

RN 722454-86-6 HCAPLUS

CN Phosphorodifluoridimidic acid, acetyl-, phenyl ester (9CI) (CA INDEX NAME)



RE.CNT 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L10 ANSWER 4 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:162949 HCAPLUS

DN 140:202437

TI Improvement of pigment-sensitized photoelectrochemical cell

IN Yoshikawa, Masato; Ohno, Shingo; Kobayashi, Taichi; Sugimura, Takayuki;  
Iwabuchi, Yoshinori; Shiino, Osamu; Sugiyama, Hideo; Horikawa, Yasuo;  
Toyosawa, Shinichi

PA Bridgestone Corporation, Japan

SO PCT Int. Appl., 110 pp.

CODEN: PIXXD2

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004017452	A1	20040226	WO 2003-JP9983	20030806
	W:				
	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
	RW:				
	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	EP 1536508	A1	20050601	EP 2003-788043	20030806
	R:				
	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
PRAI	JP 2002-235393	A	20020813		

	JP 2002-235405	A	20020813
	JP 2002-235408	A	20020813
	JP 2002-288939	A	20021001
	JP 2002-317340	A	20021031
	JP 2002-361067	A	20021212
	JP 2002-361068	A	20021212
	JP 2002-361069	A	20021212
	JP 2002-361071	A	20021212
	WO 2003-JP9983	W	20030806

AB An electrolyte for pigment-sensitized solar cells has an oxidation-reduction material loaded on a vulcanized rubber, a polyphosphazene, an EVA resin, or a porous body comprising a polymer that has a three-dimensional continuous network skeleton structure. The photoelectrochem. cell has the above electrolyte placed between dye-sensitized semiconductor electrodes and a counter electrode opposed to the semiconductor electrodes. The photoelectrochem. cells, using the above electrolyte, has improved generation efficiency, durability, and safety and less manufacturing cost.

IC ICM H01M014-00  
ICS H01B001-06; H01L031-04

CC 52-2 (**Electrochemical**, Radiational, and Thermal Energy Technology)

ST pigment sensitized photoelectrochem cell electrolyte; electrolyte vulcanized rubber polyphosphazene EVA resin porous polymer; oxidn redn material electrolyte photoelectrochem cell

IT Electrolytes  
Photoelectrochemical cells  
(electrolytes containing oxidation-reduction material loaded vulcanized rubbers, polyphosphazenes, EVA resin, or porous polymers for photoelectrochem. cells)

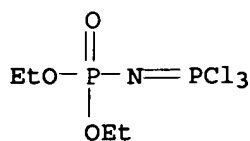
IT Polycarbonates, uses  
Polyesters, uses  
RL: DEV (Device component use); USES (Uses)  
(electrolytes containing oxidation-reduction material loaded vulcanized rubbers, polyphosphazenes, EVA resin, or porous polymers for photoelectrochem. cells)

IT 7553-56-2, Iodine, uses 7631-86-9, Silica, uses 9010-79-1, Ethylene-propylene copolymer 9019-71-0, Butadiene-styrene-vinylpyridine copolymer 10377-51-2, Lithium iodide 13463-67-7, Titania, uses 25038-59-9, PET, uses 50926-11-9, ITO **92713-54-7** 218151-78-1, 1,2-Dimethyl-3-propyl imidazolium iodide 663617-66-1 663617-67-2  
RL: DEV (Device component use); USES (Uses)  
(**electrolytes** containing oxidation-reduction material loaded vulcanized rubbers, polyphosphazenes, EVA resin, or porous polymers for photoelectrochem. cells)

IT **92713-54-7**  
RL: DEV (Device component use); USES (Uses)  
(**electrolytes** containing oxidation-reduction material loaded vulcanized rubbers, polyphosphazenes, EVA resin, or porous polymers for photoelectrochem. cells)

RN 92713-54-7 HCAPLUS

CN Phosphoramidic acid, (trichlorophosphoranylidene)-, diethyl ester (9CI)  
(CA INDEX NAME)



RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L10 ANSWER 5 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2004:139816 HCAPLUS

DN 140:184695

TI Secondary nonaqueous electrolyte **battery**

IN Narioka, Yoshinori; Mori, Sumio

PA Japan Storage Battery Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 14 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004055208	A2	20040219	JP 2002-208280	20020717
PRAI	JP 2002-208280		20020717		

AB The **battery** has an active mass containing anode and a Li salt dissolved nonaq. electrolyte solution; where the electrolyte solution has a halo-containing phosphazene compound and the anode has a binder comprising a non-halo material.

IC ICM H01M010-40

ICS H01M004-02; H01M004-62

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary **battery** electrolyte halo contg phosphazene compd; anode binder nonhalo compd secondary **battery**

IT Fluoropolymers, uses

Styrene-butadiene rubber, uses

RL: DEV (Device component use); USES (Uses)

(anode binder; anode binders containing non-halo materials for secondary lithium **batteries**)

IT **Battery** anodes

(anode binders containing non-halo materials for secondary lithium **batteries**)

IT **Battery** electrolytes

(electrolyte solns. having halo-containing phosphazene compds. for secondary lithium **batteries**)

IT Secondary **batteries**

(secondary lithium **batteries** having halo-containing phosphazene compds. in electrolyte solns. and non-halo materials in anodes)

IT 7782-42-5, Graphite, uses

RL: DEV (Device component use); USES (Uses)

(anode active mass; anode binders containing non-halo materials for secondary lithium **batteries**)

IT 24937-79-9, PvdF

RL: DEV (Device component use); USES (Uses)

(anode binder; anode binders containing non-halo materials for secondary lithium **batteries**)

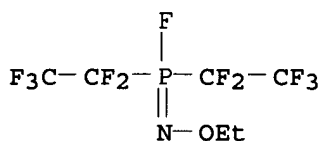
IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 21324-40-3, Lithium hexafluorophosphate 657348-91-9

RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. having halo-containing phosphazene compds.  
 for secondary lithium **batteries**)

IT 9003-55-8  
 RL: DEV (Device component use); USES (Uses)  
 (styrene-butadiene rubber, anode binder; anode binders containing non-halo  
 materials for secondary lithium **batteries**)

IT 657348-91-9  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. having halo-containing phosphazene compds.  
 for secondary lithium **batteries**)

RN 657348-91-9 HCAPLUS  
 CN Phosphinimidic fluoride, N-ethoxy-P,P-bis(pentafluoroethyl)- (9CI) (CA  
 INDEX NAME)



L10 ANSWER 6 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 2003:396161 HCAPLUS  
 DN 138:392003  
 TI Low-temperature electrolysis of alkali metal halides for metal preparation  
 IN Jacobson, Stephen Ernest; Mah, Dennie Turin  
 PA USA  
 SO U.S. Pat. Appl. Publ., 8 pp.  
 CODEN: USXXCO  
 DT Patent  
 LA English  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2003094379	A1	20030522	US 2001-989880	20011121
	US 6787019	B2	20040907		
PRAI	US 2001-989880		20011121		

AB A low temperature electrolysis process that can be used for producing an alkali metal from an alkali metal halide is provided, which comprises electrolyzing an electrolyte composition comprising at least one alkali metal halide and a co-electrolyte comprising (a) a halide or halides of Group IIIA, Group IB, or Group VIII metals and (b) a halide-donating compound

IC ICM C21B015-00  
 INCL 205406000; 075711000  
 CC 72-5 (**Electrochemistry**)  
 Section cross-reference(s): 49, 56

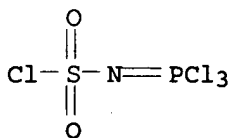
ST low temp electrolysis alkali metal halides halide donation compd; alkali metal prep electrolysis low temp halide

IT Alkali metal halides, reactions  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (low-temperature electrolysis for metal preparation)

IT Electrolysis  
 (low-temperature electrolysis of alkali metal halides for metal preparation)

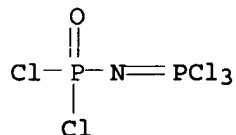
IT Salts, uses  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (molten; low-temperature electrolysis of alkali metal halides for metal

- preparation in electrolyte containing halide donation compound)
- IT Halides  
 RL: NUU (Other use, unclassified); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)  
 (of aluminum, boron, nickel, antimony, iron, cobalt; low-temperature electrolysis of alkali metal halides for metal preparation in electrolyte containing)
- IT Alkali metals, processes  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PREP (Preparation); PROC (Process)  
 (preparation by low-temperature electrolysis of alkali metal halides)
- IT 7782-50-5, Chlorine, processes  
 RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)  
 (formation during low-temperature electrolysis of alkali metal halides for metal preparation in electrolyte containing halide donation compound)
- IT 7647-14-5, Sodium chloride, reactions  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (low-temperature electrolysis for metal preparation in electrolyte containing AlCl<sub>3</sub> and trichlorophosphazosulfonyl chloride)
- IT 124-63-0, Methanesulfonyl chloride 14700-21-1, Trichlorophosphazosulfonyl chloride  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (low-temperature electrolysis of alkali metal halides for metal preparation in electrolyte containing)
- IT 7446-70-0P, Aluminum chloride, uses 13966-08-0P  
 RL: NUU (Other use, unclassified); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)  
 (low-temperature electrolysis of alkali metal halides for metal preparation in electrolyte containing)
- IT 7440-23-5P, Sodium, processes  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PREP (Preparation); PROC (Process)  
 (preparation by low-temperature electrolysis of sodium chloride in electrolyte containing AlCl<sub>3</sub> and trichlorophosphazosulfonyl chloride)
- IT 14700-21-1, Trichlorophosphazosulfonyl chloride  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (low-temperature electrolysis of alkali metal halides for metal preparation in electrolyte containing)
- RN 14700-21-1 HCAPLUS
- CN Sulfamoyl chloride, (trichlorophosphoranylidene)- (7CI, 8CI, 9CI) (CA INDEX NAME)



- IT 13966-08-0P  
 RL: NUU (Other use, unclassified); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)  
 (low-temperature electrolysis of alkali metal halides for metal preparation in electrolyte containing)

RN 13966-08-0 HCAPLUS  
 CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI) (CA INDEX NAME)



RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L10 ANSWER 7 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2001:873246 HCAPLUS

DN 136:20156

TI Preparation of sulfonyl-containing phosphazenes

IN Narita, Yukio; Saito, Tadashi; Ohara, Nobuhiko; Wakui, Atsushi; Kamata, Tomohisa

PA Nippon Chemical Industrial Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

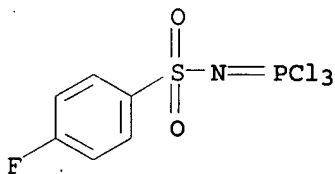
DT Patent

LA Japanese

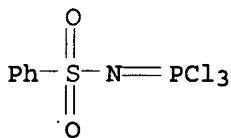
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001335590	A2	20011204	JP 2000-157053	20000526
PRAI	JP 2000-157053		20000526		
OS	CASREACT 136:20156; MARPAT 136:20156				
AB	The title (R1O)3P:NSO2R2 [R1 = (CH2CH2O)nMe which may be substituted with halo (n = 1-5); R2 = C1-12 (halo)alkyl, (halo)phenyl, C1-4 alkyl-(halo)phenyl] (I), useful as electrolytes for nonaq. secondary <b>batteries</b> , flame retardants for lubricants, etc., are prepared by treating phosphorus pentahalides with H2NSO2R2 (R2 = same as above) and then treating the resulting X3P:NSO2R2 (R2 = same as above; X = halo) (II) with R1OM (R1 = same as above; M = alkali metal). E.g., a mixture of PCl5, PhSO2NH2, toluene, and THF was stirred at room temperature for 2.5 h to give 96.9% II (R2 = Ph, X = Cl) (III). An alcoholate solution, prepared from MeOCH2CH2OH and NaH in THF, was added dropwise to a mixture of III and toluene at 0-10° and then the reaction mixture was stirred at room temperature for 3.5 h to give 78.4% I (R1 = CH2CH2OMe, R2 = Ph).				
IC	ICM C07F009-24				
CC	ICS H01G009-038; H01G009-035; H01M006-16; H01M010-40				
ST	29-7 (Organometallic and Organometalloidal Compounds)				
IT	Section cross-reference(s): 52				
ST	methoxyethylphosphazosulfonylbenzene prepn electrolyte nonaq secondary <b>battery</b> ; phosphazosulfonyl compd prepn electrolyte nonaq secondary <b>battery</b> ; phosphorus pentahalide condensation sulfonamide; halophosphazosulfonyl compd condensation glycol ether alcoholate				
IT	<b>Battery</b> electrolytes (preparation of phosphazosulfonyl compds. as electrolytes for nonaq. secondary <b>batteries</b> )				
IT	Phosphazenes RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation) (preparation of phosphazosulfonyl compds. as electrolytes for nonaq. secondary <b>batteries</b> )				

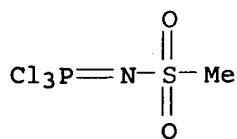
- IT 111-77-3P, Diethylene glycol monomethyl ether 1525-81-1P,  
N-4-Fluorobenzenesulfonyl-P,P,P-trichlorophosphazene 5666-55-7P,  
Trichlorophosphazosulfonylbenzene 19278-10-5P, Diethylene glycol  
monomethyl ether sodium salt 29651-24-9P 377780-52-4P,  
N-2,4-Difluorobenzenesulfonyl-P,P,P-trichlorophosphazene  
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic  
preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation of phosphazosulfonyl compds. as electrolytes for  
nonaq. secondary batteries)
- IT 377780-53-5P 377780-54-6P 377780-55-7P 377780-56-8P  
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP  
(Preparation)  
(preparation of phosphazosulfonyl compds. as electrolytes for nonaq.  
secondary batteries)
- IT 98-10-2, Benzenesulfonamide 109-86-4, Ethylene glycol monomethyl ether  
402-46-0, 4-Fluorobenzenesulfonamide 3139-99-9, Ethylene glycol  
monomethyl ether sodium salt 3144-09-0, Methanesulfonamide 10026-13-8,  
Phosphorus pentachloride 13656-60-5, 2,4-Difluorobenzenesulfonamide  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(preparation of phosphazosulfonyl compds. as electrolytes for nonaq.  
secondary batteries)
- IT 1525-81-1P, N-4-Fluorobenzenesulfonyl-P,P,P-trichlorophosphazene  
5666-55-7P, Trichlorophosphazosulfonylbenzene 29651-24-9P  
377780-52-4P, N-2,4-Difluorobenzenesulfonyl-P,P,P-  
trichlorophosphazene  
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic  
preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation of phosphazosulfonyl compds. as electrolytes for  
nonaq. secondary batteries)
- RN 1525-81-1 HCAPLUS  
CN Phosphorimidic trichloride, [(4-fluorophenyl)sulfonyl]- (9CI) (CA INDEX  
NAME)



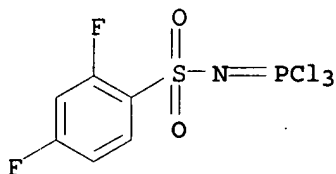
- RN 5666-55-7 HCAPLUS  
CN Phosphorimidic trichloride, (phenylsulfonyl)- (6CI, 8CI, 9CI) (CA INDEX  
NAME)



- RN 29651-24-9 HCAPLUS  
CN Phosphorimidic trichloride, (methylsulfonyl)- (8CI, 9CI) (CA INDEX NAME)



RN 377780-52-4 HCAPLUS  
 CN Phosphorimidic trichloride, [(2,4-difluorophenyl)sulfonyl]- (9CI) (CA INDEX NAME)



L10 ANSWER 8 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 2001:369718 HCAPLUS

DN 134:367047

TI Preparation of sulfonyl-containing phosphazenes as flame retardants for **battery** electrolytes

IN Tsuchiya, Tsubasa; Kawakabe, Hiroshi; Wakui, Atsushi; Kamata, Tomohisa

PA Nippon Chemical Industrial Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

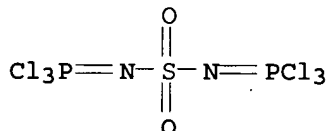
LA Japanese

FAN.CNT 1

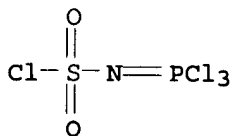
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001139584	A2	20010522	JP 1999-325440	19991116
PRAI	JP 1999-325440		19991116		
OS	CASREACT 134:367047; MARPAT 134:367047				
AB	Title compds. (R1O)3P:NSO3R1 or (R2O)3P:NSO2N:P(OR2)3 [R1, R2 = (ether-containing) C1-10 alkyl, haloalkyl] are prepared by reaction of PX5 (X = halo) with sulfamic acid or sulfamide followed by ROM (R = same as R1 or R2; M = alkali metal). PC15 was treated with sulfamic acid in PhCl at 100-105° for 12 h to give 68.8% Cl3P:NSO2Cl, which was treated with diethylene glycol monomethyl ether alcoholate in THF at -22 to -20° for 1 day to give 75.2% (MeOC2H4OC2H4O)3P:NSO3C2H4OC2H4OMe.				
IC	ICM C07F009-24				
	ICS C09K021-12				
CC	29-7 (Organometallic and Organometalloidal Compounds)				
	Section cross-reference(s): 52				
ST	sulfonyl phosphazene prepn flame retardant electrolyte; <b>battery</b> electrolyte flame retardant phosphazene prepn; sulfamic acid reaction phosphorus pentahalide alcoholate; sulfamide reaction phosphorus pentahalide alcoholate				
IT	<b>Battery</b> electrolytes				
	Fireproofing agents				
	(preparation of sulfonyl-containing phosphazenes as flame retardants for <b>battery</b> electrolytes)				
IT	Metal alkoxides				
	RL: RCT (Reactant); RACT (Reactant or reagent)				



- (preparation of sulfonyl-containing phosphazenes as flame retardants for battery electrolytes)
- IT 109-86-4D, Ethylene glycol monomethyl ether, salts 111-77-3D, Diethylene glycol monomethyl ether, salts 141-52-6, Sodium ethoxide 5329-14-6, Sulfamic acid 7803-58-9, Sulfamide 10026-13-8, Phosphorus pentachloride  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (preparation of sulfonyl-containing phosphazenes as flame retardants for battery electrolytes)
- IT 14259-65-5P, Bis(trichlorophosphazo) sulfone 14700-21-1P, Trichlorophosphazosulfonyl chloride  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (preparation of sulfonyl-containing phosphazenes as flame retardants for battery electrolytes)
- IT 72250-12-5P 271771-13-2P 271771-14-3P 271771-15-4P  
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (preparation of sulfonyl-containing phosphazenes as flame retardants for battery electrolytes)
- IT 14259-65-5P, Bis(trichlorophosphazo) sulfone 14700-21-1P, Trichlorophosphazosulfonyl chloride  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (preparation of sulfonyl-containing phosphazenes as flame retardants for battery electrolytes)
- RN 14259-65-5 HCAPLUS  
 CN Phosphorimidic trichloride, sulfonylbis- (9CI) (CA INDEX NAME)



- RN 14700-21-1 HCAPLUS  
 CN Sulfamoyl chloride, (trichlorophosphoranylidene)- (7CI, 8CI, 9CI) (CA INDEX NAME)



- L10 ANSWER 9 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 1998:686074 HCAPLUS  
 DN 130:25419  
 TI Polyphosphazenes with Novel Architectures: Influence on Physical Properties and Behavior as Solid Polymer Electrolytes  
 AU Allcock, Harry R.; Sunderland, Nicolas J.; Ravikiran, Ramakrishna; Nelson, James M.  
 CS Department of Chemistry, The Pennsylvania State University, University Park, PA, 16802, USA  
 SO Macromolecules (1998), 31(23), 8026-8035

CODEN: MAMOBX; ISSN: 0024-9297

PB American Chemical Society

DT Journal

LA English

AB Three types of polyphosphazenes with different architectures have been synthesized and characterized. The influence of the polymer architecture on solid ionic conductivity was of particular interest. The first type includes linear oligo- and polyphosphazenes with the general formula  $[N:P(OCH_2CH_2OCH_2CH_2OCH_3)_2]_n$  (MEEP) with different chain lengths. The second type consists of a series of tri-armed star-branched polyphosphazenes with the general formula  $N\{CH_2CH_2NH(CF_3CH_2O)_2P[N:P(OCH_2CH_2OCH_2CH_2OCH_3)_2]_n\}_3$  with different arm lengths. These were synthesized via the reaction of the tridentate initiator  $[N\{CH_2CH_2NH(CF_3CH_2O)_2P:N-PCl_3\}_3][PCl_6]^-$  with the phosphoranimine  $Cl_3P:NSiMe_3$  in  $CH_2Cl_2$  followed by halogen replacement with sodium (methoxyethoxy)ethoxide. The mol. wts. in this system were carefully controlled by variation of the monomer-to-initiator ratios, and the effect of polymer mol. weight on solid ionic conductivity was examined. The third polymer system was designed to examine the effect of complex branching on ionic conductivity. Thus, a highly branched polymer containing five branches from a cyclotriphosphazene pendent side group (with 26 ethyleneoxy units per repeat unit) was synthesized. The conductivity of this polymer in the presence of three different salts has been measured and compared to the behavior of MEEP with a corresponding mol. weight. The mechanism of ion transport in these systems is discussed.

CC 35-7 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 37, 52, 76

ST polyphosphazene novel structure lithium complex ionic cond

IT Polymerization

Polymerization

Polymerization catalysts

Polymerization catalysts

(cationic, living; preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)

IT Battery electrolytes

Glass transition temperature

Ionic conductivity

Molecular weight

Polymer electrolytes

(preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)

IT 131841-09-3P

RL: SPN (Synthetic preparation); PREP (Preparation)

(byproduct in preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)

IT 10026-13-8, Phosphorus pentachloride

RL: CAT (Catalyst use); USES (Uses)

(catalyst; preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)

IT 33454-82-9, Lithium triflate

RL: MOA (Modifier or additive use); USES (Uses)

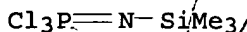
(electrolytes; preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)

IT 188186-00-7 216530-14-2

RL: RCT (Reactant); RACT (Reactant or reagent)

(initiator used as core for branched polyphosphazenes; preparation of

- polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)
- IT 19278-10-5DP, 2-(2-Methoxyethoxy)ethanol sodium salt, reaction products with poly(dichlorophosphazene), lithium complexes 26085-02-9DP, Poly(dichlorophosphazene), derivs., lithium complexes 40678-60-2DP, derivs., lithium complexes
- RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (linear and branched; preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)
- IT 216530-18-6DP, reaction products with poly(dichlorophosphazene), lithium complexes
- RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)
- IT 7439-93-2DP, Lithium, complexes with polyphosphazenes, preparation
- RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)
- IT 110-87-2 112-27-6 19278-10-5, 2-(2-Methoxyethoxy)ethanol sodium salt
- RL: RCT (Reactant); RACT (Reactant or reagent) (reactant in preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)
- IT 60221-37-6P 132939-00-5P 216530-17-5P 216530-18-6P
- RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent) (reactant in preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)
- IT 40678-60-2DP, derivs., lithium complexes
- RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (linear and branched; preparation of polyphosphazenes with novel architecture, their phys. properties, and ionic conductivity of solid polymer electrolytes prepared by complexation of polyphosphazenes with lithium)
- RN 40678-60-2 HCAPLUS
- CN Phosphorimidic trichloride, (trimethylsilyl)- (9CI) (CA INDEX NAME)

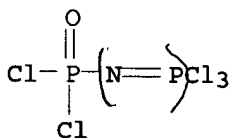


RE.CNT 44 THERE ARE 44 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

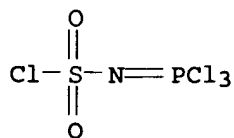
L10 ANSWER 10 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 1998:681962 HCAPLUS  
DN 129:262843  
TI High conductivity electrolyte solutions and secondary batteries  
using the solutions  
IN Angell, Charles Austen; Zhang, Sheng-Shui; Xu, Kang  
PA Arizona Board of Regents, USA  
SO U.S., 14 pp.  
CODEN: USXXAM

DT Patent  
LA English  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5824433	A	19981020	US 1996-748009	19961112
PRAI	US 1996-748009		19961112		
OS	MARPAT 129:262843				
AB	The electrolyte solns. contain an electrolyte solute and a sulfonyl/phospho compound solvent RSO <sub>2</sub> X (X = halide and R = perfluoroalkyl group, perchlorinated group, N:PX <sub>3</sub> ) or X <sub>3</sub> P:NR' [R' = P(O)X <sub>2</sub> or C1-6 alkyl group]. The solvent may contain Cl <sub>3</sub> PNSO <sub>2</sub> Cl, Cl <sub>3</sub> PNP(O)Cl <sub>2</sub> , Cl <sub>3</sub> PNCH <sub>3</sub> , Cl <sub>3</sub> PNCH <sub>2</sub> CH <sub>3</sub> , and/or CF <sub>3</sub> (CF <sub>2</sub> ) <sub>3</sub> SO <sub>2</sub> F; and the electrolyte solute os LiAlCl <sub>4</sub> or (CF <sub>3</sub> SO <sub>2</sub> ) <sub>2</sub> NLi. The electrolyte may also contain a polymer.				
IC	ICM H01M006-14				
INCL	429194000				
CC	52-2 (Electrochemical, Radiational, and Thermal Energy Technology)				
ST	lithium battery electrolyte solvent; battery electrolyte solvent sulfur phosphorous compd				
IT	Battery electrolytes (high conductivity electrolyte solns. containing sulfur-phosphorus compound electrolyte solvents for secondary lithium batteries and sodium/sulfur batteries)				
IT	124-63-0, Methanesulfonyl chloride 9011-14-7, Pmma 14024-11-4, Aluminum lithium chloride (LiAlCl <sub>4</sub> ) 90076-65-6 RL: DEV (Device component use); USES (Uses) (high conductivity electrolyte solns. containing sulfur-phosphorus compound electrolyte solvents for secondary batteries)				
IT	13966-08-0P 14700-21-1P 23453-30-7P 44584-14-7P RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (high conductivity electrolyte solns. containing sulfur-phosphorus compound electrolyte solvents for secondary batteries)				
IT	13966-08-0P 14700-21-1P 23453-30-7P 44584-14-7P RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (high conductivity electrolyte solns. containing sulfur-phosphorus compound electrolyte solvents for secondary batteries)				
RN	13966-08-0 HCAPLUS				
CN	Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI) (CA INDEX NAME)				

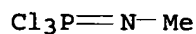


RN 14700-21-1 HCAPLUS  
CN Sulfamoyl chloride, (trichlorophosphoranylidene)- (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 23453-30-7 HCAPLUS

CN Phosphorimidic trichloride, methyl- (8CI, 9CI) (CA INDEX NAME)



RN 44584-14-7 HCAPLUS

CN Phosphorimidic trichloride, ethyl- (9CI) (CA INDEX NAME)



RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L10 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1997:443306 HCAPLUS

DN 127:53454

TI **Electrochemically** stable electrolytes which do not crystallize  
at ambient temperature

IN Angell, Charles Austen; Zhang, Sheng Shui; Xu, Kang

PA Arizona Board of Regents, USA

SO PCT Int. Appl., 31 pp.

CODEN: PIXXD2

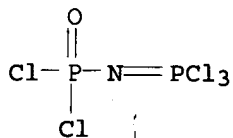
DT Patent

LA English

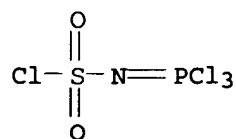
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9718159	A1	19970522	WO 1996-US18325	19961113
	W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
	US 5855809	A	19990105	US 1996-748008	19961112
	AU 9676807	A1	19970605	AU 1996-76807	19961113
PRAI	US 1995-6437P	P	19951113		
	US 1996-748008	A	19961112		
	WO 1996-US18325	W	19961113		
AB	The electrolytes are quasi-salt inorg. ionic liqs. which comprise the reaction product of a strong Lewis acid with an inorg. halide-donating mol., which comprises a substructure selected from NPX <sub>3</sub> , SO <sub>2</sub> X, and C(O)X, where X is a halogen. The strong Lewis acid is selected from AlCl <sub>3</sub> , BCl <sub>3</sub> , SbCl <sub>3</sub> , and FeCl <sub>3</sub> . These quasi-salt inorg. ionic liquid mixts. are useful electrolytes.				
IC	ICM C01B021-06				
	ICS C01B025-10; C01C001-02; H01B001-00				

- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 49
- ST **battery** electrolyte **electrochem** stable; halide donating mol Lewis acid electrolyte
- IT **Battery** electrolytes  
(**electrochem.** stable which do not crystallize at ambient temperature)
- IT 7446-70-0D, Aluminum chloride (AlCl<sub>3</sub>), reaction product with inorg. halide-donating mol., processes 7705-08-0D, Iron chloride (FeCl<sub>3</sub>), reaction product with inorg. halide-donating mol., processes 10025-91-9D, Antimony chloride (SbCl<sub>3</sub>), reaction product with inorg. halide-donating mol. 10294-34-5D, Boron chloride (BCl<sub>3</sub>), reaction product with inorg. halide-donating mol.  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(**electrochem.** stable electrolytes from)
- IT 75-36-5DP, Acetyl chloride, reaction product with aluminum chloride  
13966-08-0DP, reaction product with aluminum chloride  
14700-21-1DP, reaction product with aluminum chloride  
23453-30-7DP, reaction product with aluminum chloride  
44584-14-7DP, reaction product with boron chloride  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)  
(**electrochem.** stable electrolytes from)
- IT 2926-30-9, Sodium trifluoromethanesulfonate 7784-16-9, Sodium chloroaluminate 14024-11-4, Lithium chloroaluminate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6, Lithium bis(trifluoromethylsulfonyl)imide 91742-21-1, Sodium bis(trifluoromethylsulfonyl)imide  
RL: MOA (Modifier or additive use); USES (Uses)  
(quasi-salt inorg. ionic liquid electrolytes containing)
- IT 13966-08-0DP, reaction product with aluminum chloride  
14700-21-1DP, reaction product with aluminum chloride  
23453-30-7DP, reaction product with aluminum chloride  
44584-14-7DP, reaction product with boron chloride  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)  
(**electrochem.** stable electrolytes from)
- RN 13966-08-0 HCAPLUS
- CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI) (CA INDEX NAME)

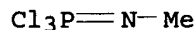


- RN 14700-21-1 HCAPLUS
- CN Sulfamoyl chloride, (trichlorophosphoranylidene)- (7CI, 8CI, 9CI) (CA INDEX NAME)



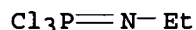
RN 23453-30-7 HCAPLUS

CN Phosphorimidic trichloride, methyl- (8CI, 9CI) (CA INDEX NAME)



RN 44584-14-7 HCAPLUS

CN Phosphorimidic trichloride, ethyl- (9CI) (CA INDEX NAME)



L10 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1997:440216 HCAPLUS

DN 127:53456

TI Sulfonyl/phospho-compound solvent for high-conductivity electrolyte solutions and secondary batteries incorporating these solutions

IN Angell, Charles Austen; Zhang, Sheng Shui; Xu, Kang

PA Arizona State University, Board of Regents, USA

SO PCT Int. Appl., 21 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9718595	A1	19970522	WO 1996-US18324	19961113
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	RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
	AU 9710524	A1	19970605	AU 1997-10524	19961113
PRAI	US 1995-6436P	P	19951113		
	WO 1996-US18324	W	19961113		
OS	MARPAT 127:53456				
AB	The solvent is selected from Cl <sub>3</sub> PNSO <sub>2</sub> Cl, Cl <sub>3</sub> PNP(O)Cl <sub>2</sub> , Cl <sub>3</sub> PNCH <sub>3</sub> , and Cl <sub>3</sub> PNCH <sub>2</sub> CH <sub>3</sub> . A sulfonyl/phospho-compound electrolyte solution comprises an electrolyte solute and a sulfonyl/phospho-compound electrolyte solvent.				
IC	ICM H01M006-14				
	ICS H01M006-16; H01M006-04				
CC	52-2 (Electrochemical, Radiational, and Thermal Energy Technology)				
	Section cross-reference(s): 49, 76				
ST	battery electrolyte solvent sulfonyl phospho compd				
IT	Battery electrolytes				

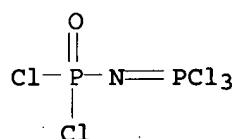
(sulfonyl/phospho-compound solvent for high-conductivity)

IT 124-63-0, Methyl sulfonyl chloride  
 RL: DEV (Device component use); USES (Uses)  
 (solvent for high-conductivity **battery** electrolyte solns.)

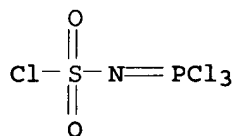
IT 13966-08-0P 14700-21-1P 23453-30-7P  
 44584-14-7P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (solvent for high-conductivity **battery** electrolyte solns.)

IT 13966-08-0P 14700-21-1P 23453-30-7P  
 44584-14-7P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (solvent for high-conductivity **battery** electrolyte solns.)

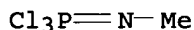
RN 13966-08-0 HCAPLUS  
 CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI) (CA INDEX NAME)



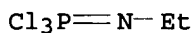
RN 14700-21-1 HCAPLUS  
 CN Sulfamoyl chloride, (trichlorophosphoranylidene)- (7CI, 8CI, 9CI) (CA INDEX NAME)



RN 23453-30-7 HCAPLUS  
 CN Phosphorimidic trichloride, methyl- (8CI, 9CI) (CA INDEX NAME)



RN 44584-14-7 HCAPLUS  
 CN Phosphorimidic trichloride, ethyl- (9CI) (CA INDEX NAME)



L10 ANSWER 13 OF 14 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 1996:744515 HCAPLUS  
 DN 126:149660  
 TI Room temperature inorganic "quasi-molten salts" as alkali-metal electrolytes  
 AU Xu, K.; Zhang, S.; Angell, C. A.  
 CS Dep. Chem., Arizona State Univ., Tempe, AZ, 85287-1604, USA  
 SO Journal of the Electrochemical Society (1996), 143(11), 3548-3554  
 CODEN: JES0AN; ISSN: 0013-4651



PB Electrochemical Society

DT Journal

LA English

AB Room temperature inorg. liqs. of high ionic conductivity were prepared by reacting Lewis

acid  $\text{AlCl}_3$  with sulfonyl chlorides. The mechanism is not clear at this time since a crystal structure study of the 1:1 complex with  $\text{CH}_3\text{SO}_2\text{Cl}$  ( $T_m = 30^\circ$ ) is not consistent with a simple chloride transfer to create  $\text{AlClO}_4^-$  anions. The liquid is in a state somewhere between ionic and mol. A new term quasi-molten salt is adopted to describe this state. A comparably conducting liquid can be made using  $\text{BCl}_3$  in place of  $\text{AlCl}_3$ . Unlike their organic counterparts based on ammonium cations (e.g., pyridinium or imidazolium) which reduce in the presence of alkali metals, this inorg. class of cation shows great stability against **electrochem.** reduction (.apprx. -1.0 V vs.  $\text{Li}^+/\text{Li}$ ), with the useful consequence that reversible lithium and sodium metal deposition/stripping can be supported. The **electrochem.** window for these quasi-salts with  $\text{AlCl}_3$  ranges up to 5.0 V, and their room temperature conductivities exceed  $10^{-4}$  S/cm. They dissolve lithium and sodium tetrachloroaluminates up to mole fraction .apprx. 0.6 at  $100^\circ$  and intermediate compns. are permanently stable at ambient. The resultant lithium or sodium salt solns. exhibit **electrochem.** windows of 4.5-5.0 V vs.  $\text{Li}^+/\text{Li}$  or  $\text{Na}^+/\text{Na}$  and show room temperature conductivities of  $10^{-3}$  to  $10^{-2}$  S/cm. In preliminary charge/discharge tests, the cell  $\text{Li}/\text{quasi-ionic liquid electrolyte}/\text{Li}1+\text{xMn}_2\text{O}_4$  showed a discharge capacity of .apprx. 110 mA-h/(g of cathode) and sustained 80% of the initial capacity after 60 cycles, indicating that these quasi-molten salt-based electrolytes are promising candidates for alkali-metal **batteries**.

CC 72-2 (**Electrochemistry**)

Section cross-reference(s): 52, 68, 76

ST room temp inorg quasi molten salt; alkali metal electrolyte quasi molten salt; sulfonyl aluminum chloride melt **electrochem** window; phosphoryl aluminum chloride melt **electrochem** window; **electrochem** potential window sulfonyl phosphoryl chloroaluminate; **battery** electrolyte inorg quasi molten salt

IT Electric potential

(electrochem. potential window of room temperature inorg. quasi-molten salts from aluminum chloride and sulfonyl chloride or phosphoryl chloride)

IT **Battery** electrolytes

(of sulfonyl chloride or phosphoryl chloride compds. with aluminum chloride)

IT Ionic conductivity

(of sulfonyl chloride or phosphoryl chloride compds. with aluminum chloride or boron chloride)

IT 7784-16-9, Sodium tetrachloroaluminate

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

(cyclic voltammetry of  $\text{NaAlCl}_4$  in trichlorophosphazosulfonyl chloride-aluminum chloride compound)

IT 14024-11-4, Lithium tetrachloroaluminate

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

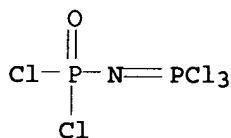
(cyclic voltammetry of trichlorophosphazosulfonyl chloride-aluminum chloride compound with and without  $\text{LiAlCl}_4$  and of  $\text{LiAlCl}_4$  in methanesulfonyl chloride)

IT 186696-36-6P

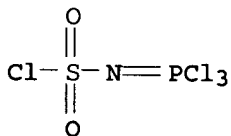
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(electrochem. potential window and room temperature inorg.

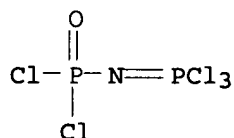
- quasi-molten salts as alkali-metal electrolytes)
- IT 186696-38-8P 186696-40-2P 186696-41-3P 186696-43-5P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (ionic conductivity and **electrochem.** potential window and room temperature  
 inorg. quasi-molten salts as alkali-metal electrolytes)
- IT 75-23-0, Ethylamine-boron trifluoride complex (1:1) 593-51-1,  
 Methylamine hydrochloride 5329-14-6, Sulfamic acid 7783-20-2,  
 Diammonium sulfate, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction with PCl<sub>5</sub>)
- IT 75-36-5, Acetyl chloride 124-63-0, Methanesulfonyl chloride  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
 (reaction with aluminum chloride: **electrochem.** potential  
 window and room temperature inorg. quasi-molten salts as alkali-metal  
 electrolytes)
- IT 6041-61-8P 13966-08-0P 14700-21-1P,  
 Trichlorophosphazosulfonyl chloride  
 RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (reaction with aluminum chloride: **electrochem.** potential  
 window and room temperature inorg. quasi-molten salts as alkali-metal  
 electrolytes)
- IT 7446-70-0, Aluminum chloride, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction with sulfonyl chloride or phosphoryl chloride for  
 quasi-molten salts)
- IT 13966-08-0P 14700-21-1P, Trichlorophosphazosulfonyl  
 chloride  
 RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP  
 (Preparation); RACT (Reactant or reagent)  
 (reaction with aluminum chloride: **electrochem.** potential  
 window and room temperature inorg. quasi-molten salts as alkali-metal  
 electrolytes)
- RN 13966-08-0 HCAPLUS  
 CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI) (CA  
 INDEX NAME)



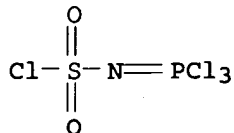
- RN 14700-21-1 HCAPLUS  
 CN Sulfamoyl chloride, (trichlorophosphoranylidene)- (7CI, 8CI, 9CI) (CA  
 INDEX NAME)



DN 125:252809  
 TI Inorganic electrolyte solutions and gels for rechargeable lithium batteries  
 AU Xu, Kang; Day, Natalie D.; Angell, C. Austen  
 CS Dep. Chem., Arizona State Univ., Tempe, AZ, 85287-1604, USA  
 SO Journal of the Electrochemical Society (1996), 143(9), L209-L211  
 CODEN: JESOAN; ISSN: 0013-4651  
 PB Electrochemical Society  
 DT Journal  
 LA English  
 AB A class of inorg. oxychloride compds. have been evaluated for use as electrolytic solvents in rechargeable lithium batteries. Compared with SO<sub>2</sub>-based electrolytes, these showed much improved safety while maintaining room temperature conductivities of 10<sup>-3</sup>-10<sup>-2</sup> S/cm and electrochem. voltage windows of 4.5-5.5 V vs. Li<sup>+</sup>/Li and supporting reversible Li metal deposition/stripping. With the addition of 2-5% polymer, the solns. acquire rubbery character with little loss of conductivity and no change in electrochem. stability. Preliminary charge/discharge tests with intercalation-type cathode as well as sulfur-based cathode showed that these inorg. electrolytes can operate with excellent reversibility.  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium battery inorg electrolyte soln gel; safety lithium battery inorg electrolyte oxychloride  
 IT Battery electrolytes  
 (inorg. electrolyte solns. and gels for rechargeable lithium batteries)  
 IT Electric conductivity and conduction  
 (ionic, inorg. electrolyte solns. and gels for rechargeable lithium batteries)  
 IT 9011-14-7, Pmma  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte additive; inorg. electrolyte solns. and gels for rechargeable lithium batteries)  
 IT 14024-11-4, Lithium tetrachloroaluminate 90076-65-6  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte; inorg. electrolyte solns. and gels for rechargeable lithium batteries)  
 IT 124-63-0, Methane sulfonylchloride 13966-08-0 14700-21-1  
 , Trichlorophosphazosulfonyl chloride  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (solvent; inorg. electrolyte solns. and gels for rechargeable lithium batteries)  
 IT 13966-08-0 14700-21-1, Trichlorophosphazosulfonyl chloride  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (solvent; inorg. electrolyte solns. and gels for rechargeable lithium batteries)  
 RN 13966-08-0 HCAPLUS  
 CN Phosphorimidic trichloride, (dichlorophosphinyl)- (6CI, 8CI, 9CI) (CA INDEX NAME)

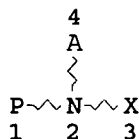


RN 14700-21-1 HCAPLUS  
 CN Sulfamoyl chloride, (trichlorophosphoranylidene)- (7CI, 8CI, 9CI) (CA  
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=> d que  
 L13 STR



*formula 2*

*187 structures from query*

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 L18 0 SEA FILE=HCAPLUS ABB=ON L16 AND ELECTROLYT?  
 L19 0 SEA FILE=HCAPLUS ABB=ON L16 AND BATTER?  
 L20 0 SEA FILE=HCAPLUS ABB=ON L16 AND ELECTROCHEM?/SC, SX, AB, BI  
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*no answers  
with utility*

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 DICTIONARY FILE UPDATES: 9 AUG 2005 HIGHEST RN 859282-03-4

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* The CA roles and document type information have been removed from *
* the IDE default display format and the ED field has been added, *
* effective March 20, 2005. A new display format, IDERL, is now *
* available and contains the CA role and document type information. *
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Structure search iteration limits have been increased. See HELP SLIMITS for details.

Experimental and calculated property data are now available. For more information enter HELP PROP at an arrow prompt in the file or refer to the file summary sheet on the web at:  
<http://www.cas.org/ONLINE/DBSS/registryss.html>

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  A
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P~N~X
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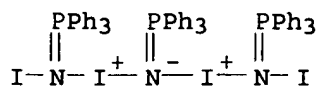
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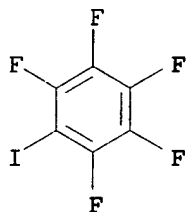
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L23 7 ANSWERS  REGISTRY  COPYRIGHT 2005 ACS on STN
IN  Iodine(1+), bis(N-iodo-P,P,P-triphenylphosphine imide-κN) [μ-
(P,P,P-triphenylphosphine imidato-κN:κN)]di-, iodide, compd.
with pentafluoriodobenzene (1:2) (9CI)
MF  C54 H45 I4 N3 P3 . 2 C6 F5 I . I

CM  1
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*7 structures with  
 3-15 phosphorus  
 per claim*



CM 2



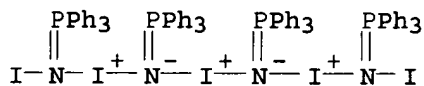
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L23 7 ANSWERS REGISTRY COPYRIGHT 2005 ACS on STN

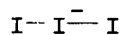
IN Iodine(1+), bis(N-iodo-P,P,P-triphenylphosphine imide-κN)bis[μ-(P,P,P-triphenylphosphine imidato-κN:κN)]tri-, (triiodide)  
(9CI)

MF C72 H60 I5 N4 P4 . I3

CM 1



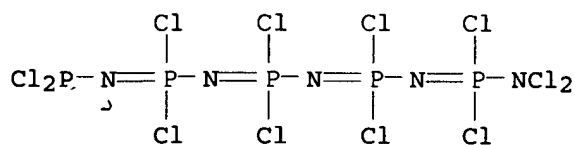
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L23 7 ANSWERS REGISTRY COPYRIGHT 2005 ACS on STN

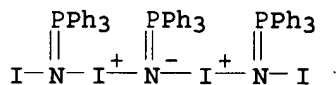
IN Phosphoramidimidic dichloride, [dichloro[[dichloro(dichloroamino)phosphoranylidene]amino]phosphoranylidene] [P,P-dichloro-N-(dichlorophosphino)phosphinimyl] - (9CI)

MF Cl12 N5 P5



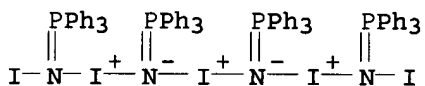
\*\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*\*

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L23 7 ANSWERS  REGISTRY  COPYRIGHT 2005 ACS on STN
IN Iodine(1+), bis(N-iodo-P,P,P-triphenylphosphine imide-κN)[μ-
(P,P,P-triphenylphosphine imidato-κN:κN)]di-, iodide (9CI)
MF C54 H45 I4 N3 P3 . I
CI CCS, COM
```

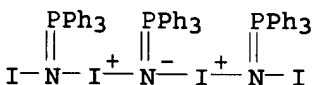


● I -

L23 7 ANSWERS REGISTRY COPYRIGHT 2005 ACS on STN  
IN Iodine(1+), bis(N-iodo-P,P,P-triphenylphosphine imide-κN)bis[μ-  
(P,P,P-triphenylphosphine imidato-κN:κN)]tri- (9CI)  
MF C72 H60 I5 N4 P4  
CI CCS, COM

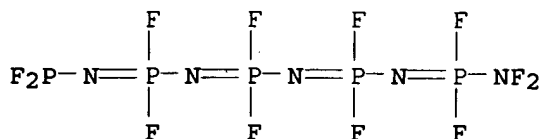


L23 7 ANSWERS REGISTRY COPYRIGHT 2005 ACS on STN  
IN Iodine(1+), bis(N-iodo-P,P,P-triphenylphosphine imide-κN) [μ-  
(P,P,P-triphenylphosphine imidato-κN:κN)]di- (9CI)  
MF C54 H45 I4 N3 P3  
CI CCS, COM



L23 7 ANSWERS REGISTRY COPYRIGHT 2005 ACS on STN  
IN Phosphoramidimidic difluoride, N-[[[(difluoroamino)difluorophosphoranyliden  
ne]amino]difluorophosphoranylidene]-N'-[N-(difluorophosphino)-P,P-

difluorophosphinimyl]- (9CI)  
MF F12 N5 P5



\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

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=> file hcapl

FILE 'HCAPLUS' ENTERED AT 11:58:50 ON 10 AUG 2005

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=> s 123

L25 2 L23

=> d 125 bib abs ind hitstr 1-2

*2 CA references from the 7 structures*

L25 ANSWER 1 OF 2 HCAPLUS COPYRIGHT 2005 ACS on STN

AN 1999:94318 HCAPLUS

DN 130:267497

TI Domino effect in the buildup of N-I-N-I chains of the N-iodine(triphenylphosphine)imine

AU Grebe, Jutta; Geiseler, Gertraud; Harms, Klaus; Neumuller, Bernhard; Dehnicke, Kurt

CS Fachbereich Chemie der Universitat, Marburg, D-35032, Germany

SO Angewandte Chemie, International Edition (1999), 38(1/2), 222-225

CODEN: ACIEF5; ISSN: 1433-7851

PB Wiley-VCH Verlag GmbH

DT Journal



LA English

AB Depending upon the stoichiometric ratio, the reaction of Ph<sub>3</sub>PNI with iodine in CH<sub>2</sub>Cl<sub>2</sub> gave [I(INPPh<sub>3</sub>)<sub>2</sub>]+I<sup>3-</sup> (1) and [I(INPPh<sub>3</sub>)<sub>4</sub>]+I<sup>3-</sup> (2). Reaction of INPPh<sub>3</sub> with I<sub>2</sub> in the presence of 1,4-diiodotetrafluorobenzene in CH<sub>2</sub>Cl<sub>2</sub> gave [I(INPPh<sub>3</sub>)<sub>3</sub>]+[I(C<sub>6</sub>F<sub>4</sub>I<sub>2</sub>)]<sup>-</sup> (3). The crystal structure of 1-3 were determined

CC 29-7 (Organometallic and Organometalloidal Compounds)  
Section cross-reference(s): 75

ST nitrogen iodine chain triphenyl phosphine imine prepn structure;  
triphenylphosphine imine nitrogen iodine chain prepn structure; crystal  
mol structure nitrogen iodine chain triphenylphosphine imine

IT Crystal structure  
Molecular structure  
(of nitrogen iodine chain triphenylphosphine imine complexes)

IT 221354-50-3P 221354-51-4P 222412-29-5P  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(preparation and crystal structure of)

IT 221354-46-7P  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(preparation and mol. structure of)

IT 392-57-4, 1,4-Diiodotetrafluorobenzene  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of iodine(triphenylphosphine)imine with iodine in presence  
of)

IT 392-57-4, 1,4-Diiodotetrafluorobenzene  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(reaction of iodine(triphenylphosphine)imine with iodine in presence  
of)

IT 221354-50-3P 222412-29-5P  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(preparation and crystal structure of)

RN 221354-50-3 HCAPLUS

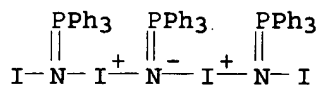
CN Iodine(1+), bis(N-iodo-P,P,P-triphenylphosphine imide-κN)[μ-(P,P,P-triphenylphosphine imidato-κN:κN)]di-, iodide, compd.  
with pentafluoroiodobenzene (1:2) (9CI) (CA INDEX NAME)

CM 1

CRN 221354-49-0

CMF C54 H45 I4 N3 P3 . I

CCI CCS

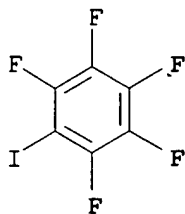


● I<sup>-</sup>

CM 2

CRN 827-15-6

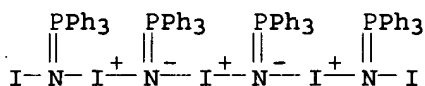
CMF C6 F5 I



RN 222412-29-5 HCAPLUS  
 CN Iodine(1+), bis(N-iodo-P,P,P-triphenylphosphine imide-κN).bis[μ-(P,P,P-triphenylphosphine imidato-κN:κN)]tri-, (triiodide)  
 (9CI) (CA INDEX NAME)

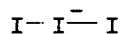
CM 1

CRN 222412-28-4  
 CMF C72 H60 I5 N4 P4  
 CCI CCS



CM 2

CRN 14900-04-0  
 CMF I3

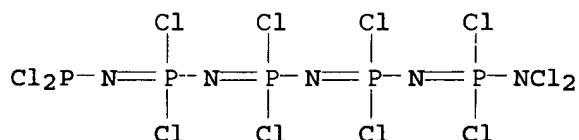


RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

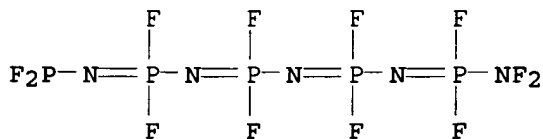
L25 ANSWER 2 OF 2 HCAPLUS COPYRIGHT 2005 ACS on STN  
 AN 1977:501818 HCAPLUS  
 DN 87:101818  
 TI Conformational analysis of phosphazenes. A force field for the calculation of the molecular structures of halophosphazenes  
 AU Boyd, Richard H.; Kesner, Laya  
 CS Dep. Mater. Sci. Eng., Univ. Utah, Salt Lake City, UT, USA  
 SO Journal of the American Chemical Society (1977), 99(13), 4248-56  
 CODEN: JACSAT; ISSN: 0002-7863  
 DT Journal  
 LA English  
 AB Phosphazenes (-N:PR2-)n are a series of compds. that include rings of various sizes and conformations and linear high-mol.-weight polymers which the formal valence structure presents the possibility of π-electron delocalization. An attempt was made to see if phosphazene properties could be accounted for in terms of a conventional conformational model in which the mols. are subject to the influences of the energetics of bond twisting, bending, and stretching (and nonbonded interactions), but in

which there are not further effects on bonding in various size mols. than from these sources (i.e., the individual bond energies do not depend on the size of the mol.). The geometries, energies, and vibrational frequencies of a number of cyclic perhalophosphazenes were satisfactorily accounted for by such a model. A force field for conformational calcns. on chloro- and fluorophosphazenes is presented. Important and necessary features of the model include a 2-fold torsional potential with a low barrier (.apprx.1.4 kcal/mol) and a soft bending constant at the PNP valence angle (both absolutely and relative to the NPN angle).

CC 22-9 (Physical Organic Chemistry)  
 ST conformation phosphazene model; force field conformation phosphazene  
 IT Molecular mechanics  
 Potential energy and function  
 (for calcn. of conformation of halophosphazenes)  
 IT Conformation and Conformers  
 Molecular structure  
 (of halophosphazenes, force-field model for calcn. of)  
 IT Phosphonitrile compounds  
 RL: PRP (Properties)  
 (halo, conformational anal. of, force-field model for calcn. of)  
 IT 940-71-6 2950-45-0 13596-41-3 14700-00-6 15599-91-4  
 63722-41-8 63722-42-9  
 RL: PRP (Properties)  
 (conformation of, calcn. of)  
 IT 63722-41-8 63722-42-9  
 RL: PRP (Properties)  
 (conformation of, calcn. of)  
 RN 63722-41-8 HCAPLUS  
 CN Phosphoramidimidic dichloride, [dichloro[[dichloro(dichloroamino)phosphora  
 nylidene]amino]phosphoranylidene] [P,P-dichloro-N-  
 (dichlorophosphino)phosphinimyl]- (9CI) (CA INDEX NAME)



RN 63722-42-9 HCAPLUS  
 CN Phosphoramidimidic difluoride, N-[[[(difluoroamino)difluorophosphoranylide  
 ne]amino]difluorophosphoranylidene]-N'-[N-(difluorophosphino)-P,P-  
 difluorophosphinimyl]- (9CI) (CA INDEX NAME)



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